DOCUMENT RESUME

ED 233 214 CE 036 747

AUTHOR Mockovak, William P.
TITLE New Approaches in Interviewer Training and Evaluation at the Census Bureau.
INSTITUTION Bureau of the Census (DOC), Suitland, Md.
PUB DATE [83]
NOTE 23p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adults; Data Collection; *Evaluation Methods; Guides; *Instructional Materials; *Interviews; *Job Training; Material Development; *Questioning Techniques; Questionnaires; Role Playing; Surveys; Telephone Communications Systems; Telephone Usage Instruction; Trainees; Trainers; *Training Methods
IDENTIFIERS *Bureau of the Census

ABSTRACT

While gathering the 1980 census, the U.S. Census Bureau tried several methods of improving its training of census interviewers. This paper covers three general areas of that experiment. First, it reviews bureau efforts to improve verbatim training and presents selected results from an alternative training experiment conducted in the 1980 census. In this experiment, a method of instruction called job-aided training was developed, was used experimentally, and was compared to census verbatim training. The job-aided training was an enhancement of verbatim training that changed it from a lecture-oriented approach to one that required active learning by the trainee. It included simplification of training materials, especially the training manual, and the addition of task analysis to the design of the materials. As a result, this training approach was more successful than others, and the bureau is planning to use it more widely for the 1990 census. Second, the paper presents an overview of training approaches being developed to support the bureau's increasing activities in centralized telephone interviewing. These approaches include self-paced instruction and classroom-housed performance-based training, especially practice interviewing exercises. Finally, the paper reviews some of the evaluation strategies being implemented to determine training effectiveness and to improve the quality of interviewing. Specifically, these strategies include selection, training, and monitoring techniques for use in a centralized telephone operation. Because of the expense of their use and the questionable results, however, such techniques may remain experimental. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED233214

NEW APPROACHES IN INTERVIEWER TRAINING AND EVALUATION AT THE CENSUS BUREAU

William P. Mockovak
U. S. Department of Commerce
Bureau of the Census

CE 036 748

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

W Mockovak

TO THE EDUCATIGNAL RESOURCES INFORMATION CENTER (ERIC)."

Overview

This paper covers three general areas. First, it reviews Bureau efforts to improve verbatim training and presents selected results from an alternative training experiment conducted in the 1980 census. Second, it presents an overview of training approaches being developed to support the Bureau's increasing activities in centralized telephone interviewing. And, third, it reviews some of the evaluation strategies being implemented to determine training effectiveness and to improve the quality of interviewing.

Section 1: Background for the Alternative Training Experiment

In the past, the Census Bureau has relied heavily on the use of training guides read verbatim to a group of trainees to deliver low cost, decentralized census training, as well as training prepared for continuing surveys. Verbatim training guides are completely structured, self-contained guides which reference all required training materials and provide step-by-step instructions for conducting training activities. Although these guides can be written in a variety of presentation styles, there is a tendency among writers of verbatim training to use more stilted language than is typically found in conventional speech. Further, since in a census context the guides are used frequently by inexperienced trainers, training writers have tended to use lecture, rather than other instructional methods, because of the fear that the trainer would lose control of the training. The result in many cases has been lecture-oriented training which has been criticized for being both boring and ineffective.

In 1978, just prior to the 1980 census, the Bureau started a program of training research with the general objective of improving existing Bureau training. The initial goal of this research was to investigate alternative methods of training with applicability to both census and survey training. However, as this analysis progressed, it soon became apparent that verbatim training had many advantages which other approaches had difficulty matching, at least in the context of a census. These advantages included the following:

- Standardization of training content
- Ease of development and revision
- Logistics (distribution, mass production)
- Ease of use (by inexperienced trainers in poor training sites)
- Low cost

Although there are several alternatives to verbatim training which could better present the content of census training guides, cost-benefit analyses raised doubts about their applicability for census jobs typically lasting 2-4 weeks. Therefore, rather than attempt to implement and evaluate a totally new instructional approach just prior to the 1980 census, the decision was made, instead, to develop the most effective verbatim training possible. The general intent was to develop a highly structured training approach, but one which required the active participation of the trainee. This effort focused on two areas: introducing variety into verbatim training and simplifying training materials (with special emphasis on reference manuals). The result was a method of training, called job-aided training, which was developed for use in the 1980 census and compared to standard census verbatim training. The major features of this training approach are discussed in the next several sections.

Introducing Variety into Census Verbatim Training

Acknowledging the fear that inexperienced trainers (i.e., individuals who, in many cases, were trained 1-2 weeks prior to the sessions they were to lead) could lose control of their training sessions, Bureau training specialists worked out approaches that avoided an over reliance on lecture for delivering information. These approaches involved the use of audio-visuals with accompanying audio-cassettes, role-playing, group learning exercises, discussion groups, individualized learning exercises, workbook exercises, and both group and individual evaluations.

The overall thrust of these activities was to change verbatim training from primarily a lecture-oriented, passive approach to one which required active learning and participation on the part of the trainee. Both training approaches compared (job-aided vs standard) in the context of the 1980 census used these training activities as a supplement to verbatim training.

Simplifying Training Materials

Much of the training that was produced for the 1980 census was based on the premise that classroom training would cover only the major, most critical job tasks. It was assumed that, once on the job, the worker would refer to existing reference materials to cue her/his memory about topics covered in training or to determine which procedures applied for topics not covered in training. (Of course, another option was to ask for supervisory assistance.) However, an analysis of existing Bureau reference materials revealed several problems with this assumption. First, information critical to performing a job task often was in more than one reference manual. Second, it was difficult to locate information in the manuals. And, finally, once the correct procedure was located, it was often difficult to use because of jargon and the presentation format. To address the dual problems of accessibility and comprehensibility of procedural information, a new training approach--called "job-aided training"--was developed and tested.

Job-aided training requires changes in both the development of instructional material and the presentation of procedural information in manuals. The nature of these changes are discussed in the following sections.

Job-Aided Training

Defined as simply as possible, job aids are any device that helps a person perform a job better. However, the majority of published research has focused on the use of "paper-and-pencil" aids and the use of alternative formats (see Lineberry and Bullock, 1980) for presenting procedural information. In the broadest sense of the word, any manual is a "job aid" but, in practice, a job aid manual has certain unique characteristics. One of these characteristics is the use of certain formats for presenting procedural information. There are three formats that have been widely used. These are checklists, flowcharts, and decision tables. Illustration 1 presents an example of a simple checklist. To use this job aid, the worker proceeds sequentially down the list.

ILLUSTRATION 1

Example of a Checklist Job Aid

3E. THERE ARE 8 OR 9 PEOPLE

Instructions: If there are 8 or 9 occupants in the housing unit, use the following checklist.

1. Put 7 people on the first questionnaire.
2. On a second questionnaire (same type as the first—short or long) put the rest of the people. *But:*

   a. Put the name of the eighth person in column 2 on page 2 and on page 8 (if long form) of the second questionnaire.
   b. Do *not* complete any housing questions on the second questionnaire (continuation).

3. Make sure address labels for both questionnaires are the same. Print "continuation" above the address label on the second questionnaire.
4. Figure 17 shows how to complete the FOR CENSUS USE ONLY boxes.
5. Make usual entries in the Master Address Register.

Another commonly used type of job aid is a flowchart (or algorithm) as shown in Illustration 2 on the next page.

ILLUSTRATION 2

Example of a Flowchart Job Aid with Accompanying Illustrations

4B. THE HOUSING UNIT DOES NOT APPEAR LIVABLE

Figure 32.

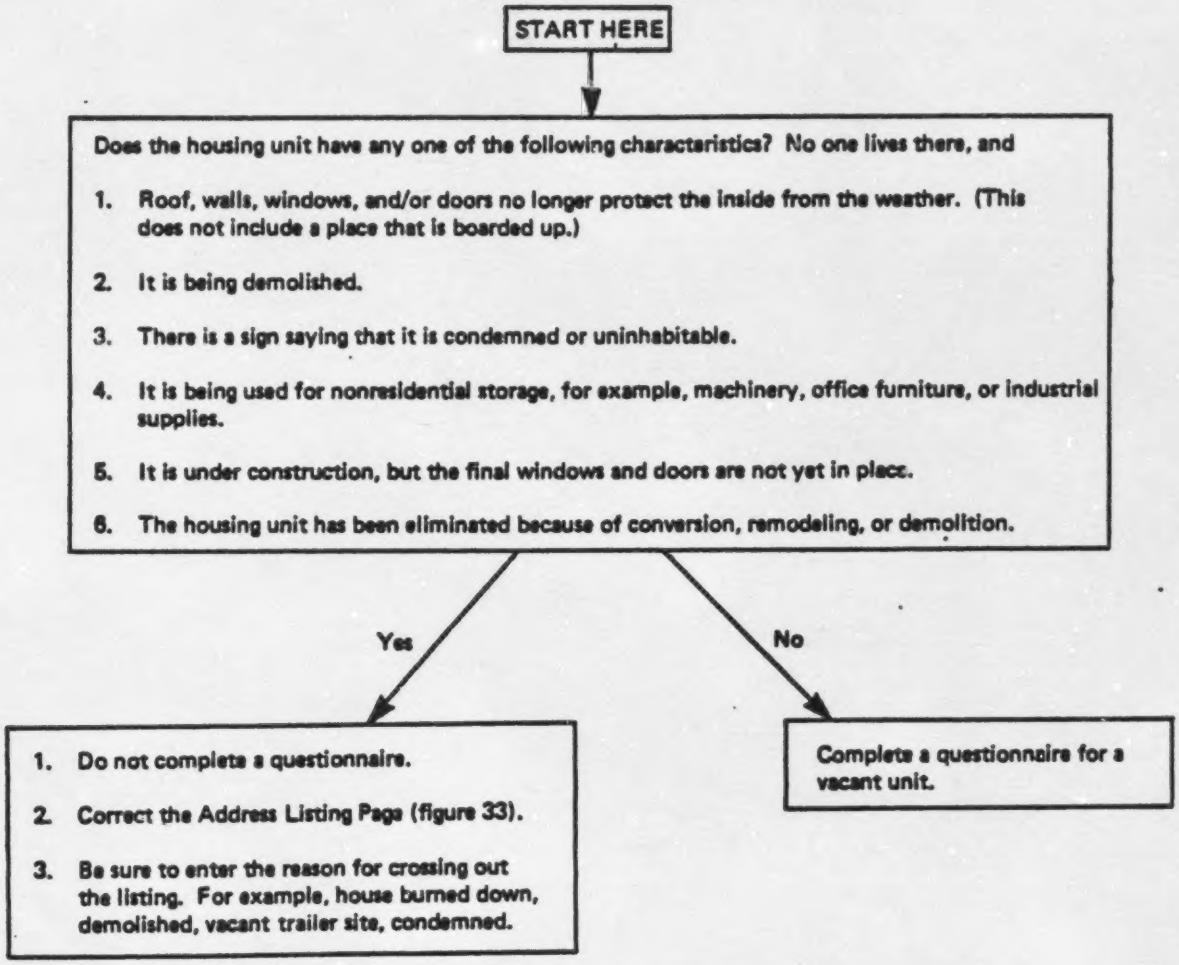
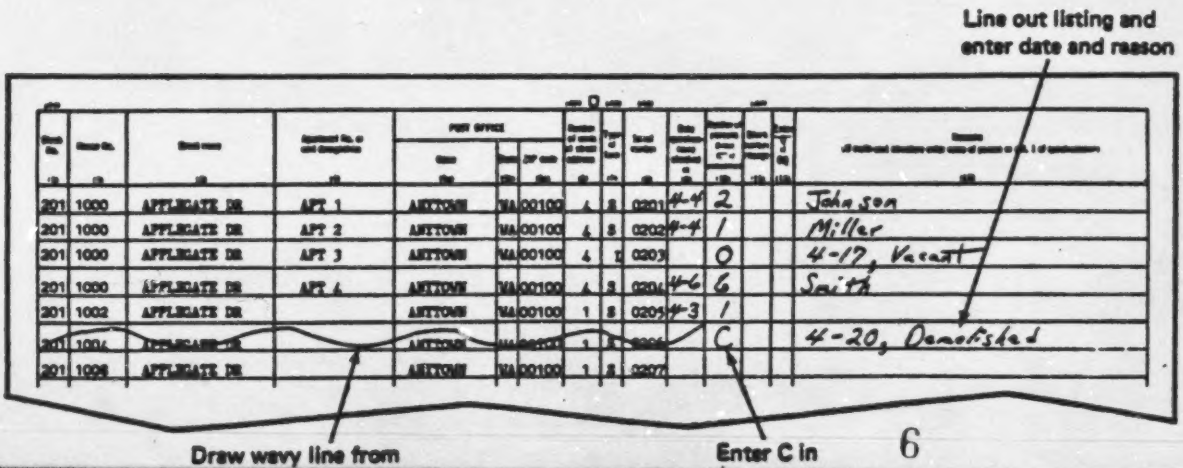

START HERE
Does the housing unit have any one of the following characteristics? No one lives there, and
1. Roof, walls, windows, and/or doors no longer protect the inside from the weather. (This does not include a place that is boarded up.)
2. It is being demolished.
3. There is a sign saying that it is condemned or uninhabitable.
4. It is being used for nonresidential storage, for example, machinery, office furniture, or industrial supplies.
5. It is under construction, but the final windows and doors are not yet in place.
6. The housing unit has been eliminated because of conversion, remodeling, or demolition.
Yes
No
1. Do not complete a questionnaire.
2. Correct the Address Listing Page (figure 33).
3. Be sure to enter the reason for crossing out the listing. For example, house burned down, demolished, vacant trailer site, condemned.
Complete a questionnaire for a vacant unit.

Figure 33. Completing the Address Listing Page when the unit appears uninhabitable.


Line out listing and enter date and reason
201 1000 APPLEGATE DR APT 1 ANYTOWN MA 00100 4 3 0201 4-4 2 Johnson
201 1000 APPLEGATE DR APT 2 ANYTOWN MA 00100 4 3 0202 4-4 1 Miller
201 1000 APPLEGATE DR APT 3 ANYTOWN MA 00100 4 1 0203 0 4-17, Vacant
201 1000 APPLEGATE DR APT 4 ANYTOWN MA 00100 4 3 0204 4-6 6 Smith
201 1002 APPLEGATE DR ANYTOWN MA 00100 1 3 0205 4-3 1
C 4-20, Demolished
201 1006 APPLEGATE DR ANYTOWN MA 00100 1 3 0207
Draw wavy line from
Enter C in

To use this aid, the worker begins in the "START" box and follows the appropriate arrows. As is apparent in Illustration 2, many of these aids are accompanied by illustrations which clarify important points in the written instructions.

A point worth noting about the flowchart job aid is that it is not as easy to use as the checklist. Whereas a trainee typically has no problem picking up a checklist and using it, a flowchart features a novel format which must first be explained during training.

The third type of job aid which is commonly used is the decision table as shown in Illustration 3.

ILLUSTRATION 3

Example of a Decision Table Job Aid

<table>
<tr><th>IF</th><th>AND</th><th>THEN</th></tr>
<tr><td>Person is:</td><td></td><td>Complete:</td></tr>
<tr><td rowspan="2">Male</td><td>Over 21</td><td>Section A</td></tr>
<tr><td>Under 21</td><td>Section D</td></tr>
<tr><td rowspan="2">Female</td><td>Over 21</td><td rowspan="2">Section E</td></tr>
<tr><td>Under 21</td></tr>
</table>

As with the flowchart job aid format, this type of job aid also requires some introduction in training prior to its use in the field. To use it, a worker simply starts in the left-hand column, finds the condition (male or female) that exists, applies any qualifying information (e.g., over or under 21), and then follows the directions in the "THEN" column.

Theoretical Rationale for Job Aids

The theoretical rationale underlying the use of job aids is that they serve as a storehouse of information which does not have to be extensively covered in training. Accordingly, training is simplified because less information needs to be covered with immediate or direct recall as performance criteria.

The design of job aids relies on theoretical concepts derived from a theory of learning, called Stimulus-Response learning theory. In concrete

terms, job aids are designed to cue a worker's memory for skills learned prior to the job (general skills) or procedures/concepts learned during training (job-specific) skills. Job aids are written using principles of clear writing and present the minimum amount of information necessary to complete a task successfully. In more sophisticated applications of job aids, designs are also employed which can be used by workers of varying degrees of skill and experience.

Steps in Integrating Job Aids and Training Design

The preceding discussion emphasized the unique formats (see Illustrations 1-3) associated with job aids, but the successful use of job aids requires more than simple design or changes in format. It is equally important that attention be paid to how training materials are developed and how the procedural manual is used in training. For example, the successful use of job aids requires at least the following steps:

1. Task analysis (to determine what the worker does).
2. Specification of training objectives.
3. Integrated design of training content and manuals to determine the following:
   a. What job tasks should be covered only in training?
   b. What job tasks should be covered only in reference manuals?
   c. What job tasks should be covered in both formal training and reference manuals?
4. Design of instruction and development of learning activities emphasizing use of the job aids (manual).
5. Concurrent validation of training and job aids.

Since the design of training and job reference manuals proceeds concurrently in the preceding model, the most immediate benefit is that subject-matter experts and training designers work together to identify critical job tasks, assign training priorities, clarify ambiguities in existing or proposed procedures, and agree on examples of competent performance. Moreover, since job aids are an important component of training, the training itself tends to be more active and skill-based, and relies less on lecture as a means of presenting information.

Ultimately, although the decision to exclude or include a specific job task in training depends on the judgment of the training designer, Joyce et al. (1973), list a variety of factors that need to be considered before making the manual-training tradeoff. Some of the general guidelines provided by Joyce et al. are that tasks covered in training should:

1. Be difficult to learn on the job.
2. Be difficult to communicate with words.
3. Require a great deal of practice.
4. Allow little room for error.
5. Be performed frequently on the job.
6. Not allow time to refer to a manual.
7. Be performed by a large number of individuals in the job area.

On the other hand, tasks suitable for a job manual are those that:

1. Have long and complex behavior sequences.
2. Are rarely performed.
3. Involve readings, tolerances, or table lookups.
4. Can be mentally rehearsed prior to performance.
5. Benefit from the use of illustrations.

The development of training activities follows readily from the development of job aids. Since job aids mirror the performance of actual job tasks, skill-based activities can be easily designed that encourage individualized learning as well as provide immediate feedback about the correctness of behavior. Moreover, formative evaluation is enhanced because the step-by-step nature of job aids quickly reveals exactly where performance problems are occurring.

Characteristics of Job-Aid Manuals and Accompanying Training

In the Alternative Training Experiment mentioned previously, a standard field procedures manual for follow-up enumerators[1/] was redesigned as a job-aid manual. One result was a significantly shorter manual. The job-aid manual was 62 pages versus 129 pages for the standard manual, even though the same procedural information was presented. Excluded from the job-aid manual was background and "nice to know" information about the census. This information was covered, instead, during training using audiovisuals and classroom lecture.

The job-aid manual also differed in its organization. The job-aid manual was organized around major job tasks and field problems as the enumerator would tend to verbalize them. To illustrate this organization, a page from the job-aid manual's Table of Contents is presented in the Appendix. On the other hand, the standard enumerator manual was organized around more general enumeration topics. For comparison, a page from the standard manual's Table of Contents is also presented in the Appendix.

Other features of the job-aid manual were that it required less cross-referencing, used more "white space" (spacing between print) to avoid a cluttered look, and principles of clear writing were used throughout. The training that accompanied the use of the job-aid manual also required 25% less lecture time than the standard enumerator training, even though comparable material was covered.

What Does Prior Research Show?

Evaluations of the use of job aids have indicated that the use of specially designed job aids enabled inexperienced maintenance personnel to outperform more experienced workers who used traditional reference materials (Foley, 1973), that job aids were well accepted by maintenance personnel whether or not they had input into their development (Johnson et al., 1977), and that job aids could be used effectively with disparate instructional methods (Swezey, 1977).

1/Follow-up 1 enumerators were responsible for obtaining information from households which failed to mail back their census questionnaires.

Evaluation of the Use of Job Aids in Census Training

In the context of the 1980 census, an alternative training approach using job aids was developed for follow-up 1 enumerators and compared to standard census training. The major difference between the standard census training and job-aided training was the use of a field procedures manual redesigned to be a job-aid manual. Three pairs of census district offices were matched on variables related to the difficulty of enumeration. The offices in each pair were then randomly assigned to one of two training methods (standard or job-aided), resulting in three experimental and three control offices. Data from 1,197 job-aided trained enumerators and 1,389 control enumerators were available for analysis. Attitudinal data were collected at the end of training and then after 2-3 days of job experience to determine if experience changed enumerator perceptions of training. Performance data were also collected but the occurrence of field problems precluded a meaningful analysis.

A general finding was that both training approaches (both employed verbatim training guides) were apparently successful in terms of positive ratings given by enumerators. Table 1 shows the responses of enumerators to the question "Overall, how would you rate the quality of the training?"

TABLE 1

ENUMERATORS' RATING OF QUALITY OF TRAINING

	End-of-Training		Post Training	
	(N=1,163)	(N=1,093)	(N=887)	(N=526)
	Job-Aided	Standard	Job-Aided	Standard
Very Good	57.0%	49.0%	58.7%	44.9%
Good	37.8%	42.1%	37.1%	46.6%
Fair	4.5%	8.3%	3.0%	8.0%
Poor	0.7%	0.5%	1.1%	0.6%

On both occasions, the job-aided (experimental) training received higher ratings. The marginal association between ratings of quality and group membership was significant for both the end-of-training ($\chi^2 = 22.7$, 3 df, $p = 0.00$) and post-training comparisons ($\chi^2 = 36.8$, 3 df, $p = 0.00$). In interpreting this result and subsequent ones, it should be recalled that enumerators saw only one type of follow-up training. Therefore, the basis for judging quality was not the standard census training.

Response rates in Table 1 for the job-aided group were higher for both the end-of-training and post-training comparisons. The reasons for these

response differences are unclear since identical clerical procedures were used in all offices. The most likely explanation appears to be that senior field supervisors liked the job-aided training and made a greater effort to distribute and retrieve evaluation forms. Their counterparts in the control offices did not oversee any alternative training, so evaluation forms may have been viewed as an unnecessary burden, and thus ignored. The lower response rate for both groups for the post-training questionnaire was caused by distribution and retrieval problems associated with a widely scattered work force. Since senior field supervisors did not train enumerators, they are not viewed as an important biasing factor. However, it is acknowledged that other systematic differences among offices could have affected the attitude measures used.

Another question dealt with an enumerator's feelings of preparedness prior to field work (end of training) and after 2-3 days of job experience. Table 2 shows the responses of enumerators to the question "How well prepared do (did) you feel to go out and work as an enumerator?"

TABLE 2

ENUMERATORS' SELF-RATINGS OF DEGREE OF PREPAREDNESS

	End-of-Training		Post Training	
	(N=1,758)	(N=1,085)	(N=919)	(N=557)
	Job-Aided	Standard	Job-Aided	Standard
Well Prepared	47.8%	48.2%	60.8%	54.8%
Adequately prepared	51.6%	50.1%	38.0%	42.7%
Poorly Prepared	0.6%	1.6%	1.0%	2.3%
Not Prepared	0.0%	0.1%	0.2%	0.2%

Again, one conclusion that can be drawn from this table is that both training approaches were successful in making enumerators feel that they were prepared for their jobs, both before and after job experience. Further, in both training approaches, the proportion of enumerators who felt that they had been "well prepared" actually increased after job experience. Two separate cross-tabulations indicated that there were no differences between the training groups in their pattern of ratings at the end of training, but a significant difference was observed at the post-training comparison ($\chi^2 = 8.45$, 3 df, $p = 0.04$). A subsequent log-linear analysis indicated that there was no three-way interaction present.

Other questions on the reaction questionnaire that enumerators completed dealt with the comprehensibility of training materials, the length of training, and coverage of critical job tasks. Consistent with expectations, the job-aided training was perceived to have used more comprehensible training materials

and to be of a more appropriate length. Further, when enumerators were asked after job experience (2-3 days) which of ten major job tasks "were not covered well enough during training," the control group more frequently checked six out of the ten tasks ($p < .05$, 1 df). There were no statistical differences on the remaining four tasks.

An important objective of the job-aided training was to use reference materials more during training. Further, since the purpose of using job aids was to make information more accessible and comprehensible in a manual, it was expected that the enumerators using the job-aid manual would use it more frequently once they began working. This expectation was also confirmed. Table 3 shows the reported use of two major job reference manuals for enumerators, the field procedures manual (job-aid or standard) and the Questionnaire Reference Book (QRB) which gave question-by-question specifications for each question on the census form. Although the QRB was not redesigned, it was included in this question to determine how frequently enumerators used manuals deemed most critical to the job.

TABLE 3

REPORTED AVERAGE DAILY USE OF JOB REFERENCE MANUALS

	(N=899)		(N=532)	
	Job-Aided	S.D.	Standard	S.D.
Field Procedures Manual (Job-Aid or Standard)	2.02	2.13	1.77	1.87
Questionnaire Reference Book	1.04	1.66	1.27	1.59

An analysis of variance model for nested factors (census district offices nested under training approach) determined that the reported use of the field procedures manual was greater in the offices which used job-aided training (Winer, 1962, p. 184). However, it was also apparent that enumerators did not use their manuals as frequently as had been expected. One possible explanation for this relatively low use of manuals was that the training had been so effective that the need to use manuals was reduced. However, another explanation is that enumerators simply resist using reference manuals and, therefore, will not use them routinely.

It was expected, based on the design of the QRB (it was a 200 page manual), that it would not be used frequently. Table 3 confirms this expectation. The difference in reported usage of the QRB between job-aided and control offices is attributed to the fact that some of the more frequently used information in the QRB (e.g., age conversion table) was also included in the job-aid manual.

Conclusions

The results of this study suggest that the use of job aids in procedural manuals and training results in more effective training. Accordingly, the Bureau is currently making plans to use this approach on a wider basis in preparations for the 1990 census.

Section 2: Training for Telephone Interviewers

Field interviewers for the Census Bureau currently do a large amount of telephone interviewing after initial personal visits to a household. Typically, this interviewing is done from the interviewer's home. Recently, however, the Bureau has been experimenting with the use of centralized telephone interviewing facilities at its Suitland headquarters for follow-up of mail surveys, one-time surveys, and continuing surveys. These experimental efforts have offered the opportunity for developing and testing alternative training approaches to verbatim training. These alternatives have emphasized self-paced, individualized instruction as well as skill-based classroom training exercises. The general approaches attempted will be discussed in the next several sections.

Alternatives to Verbatim Training: Self-Paced Instruction

A simple definition of training is that it is a process designed to encourage the acquisition of a specific set of skills and knowledges. In most survey training settings, it is possible to define these skills in behavioral, and hence, observable terms. Lecture, of course, is one instructional technique for describing or demonstrating a set of desired skills and knowledges, but its limitations are such that training must typically progress at a pace conducive to the slowest learners, much of the information presented may be unnecessary for many of the trainees, the trainee can either ignore or not attend to the lecture, and understanding a verbal description of a skill is no guarantee that the skill can be performed (for example, this latter point is analogous to explaining to a non-swimmer how to swim, and then asking him/her to jump in a pool).

Self-paced instruction deals with many of these limitations (except the last one) because it requires each person to proceed through the same material. Further, since each person proceeds at her/his own pace, training times are typically reduced and more learning occurs. Moreover, self-pacing can be accomplished using a variety of instructional options (for example, printed text, television, computers, audiovisuals, etc.). The most commonly used self-pacing technique is a printed programed text. Based on the principles of Stimulus-Response (S-R) theory in experimental psychology, the basic design of programed instruction is (1) explain what the learning objectives are, (2) present information in small, "learnable" chunks, (3) require a response from the learner to test acquisition of the objective, and (4) provide the learner with feedback about the correctness of the response.

Census Bureau Use of Self-Paced Instruction

To date, the Census Bureau has experimented with a variety of self-pacing techniques in both its censuses and surveys. The most common approach has been printed programed text but, recently, to support training

for centralized telephone interviewing, the Bureau has developed self-paced audio-cassette training (with an accompanying workbook), as well as computer-assisted instruction.

In general, the self-paced training materials that have been developed have covered general skills or knowledges. The objective of much of this training has been to present an overview and background for a specific job. For example, training prepared for centralized telephone interviewing basically covers two modules: a general interviewing skills training module and a survey-specific training module. The general interviewing skills training module covers the following topics:

1. Asking Survey Questions
2. Clarification and Probing
3. Dealing with Reluctant Respondents

The survey-specific module covers the procedures unique to a survey as well as question-by-question specifications.

A self-study approach using audio-cassettes was decided upon for two reasons. First, audio-cassettes require many of the same skills essential for a telephone interviewer. Specifically, an interviewer must listen to a spoken message, interpret it, and then record a response. Second, turnover among telephone interviewers has been a problem in many organizations. Therefore, self-pacing a portion of the training frees supervisors for other activities and speeds the training of replacements.

Limitations of Self-Paced Instruction

Although self-paced instruction requires each trainee to proceed through a set of standardized material, there are limitations to its use. For example, research conducted in the military services with self-paced training found that individuals with poor literacy skills did not do well in individualized training and, instead, preferred small-group discussions and demonstrations with a trainer (this finding led the Bureau to use audio-cassettes versus having a trainee rely on reading to acquire information). Further, there are logistical problems associated with self-paced training. For example, distributing and recovering equipment, payment for different training times, and verifying that the training was done at all are common problems. Finally, the time required to design and develop self-paced instruction is typically longer than that for comparable verbatim training. Computer-assisted (self-paced) instruction (or CAI as it is commonly called) deals with many of these problems but is even more time consuming to produce because of the special programming required. Development times of 40 or more hours for each hour of instructional time on a computer are considered excellent, and one research project that this writer was involved with in military technical training resulted in development times well in excess of 100 hours for each average hour of instruction.

Another general limitation of any type of self-paced training (but especially true of CAI and audiovisual training) is that last-minute revisions and changes in procedures are time consuming and expensive to incorporate. It is relatively easy to change a page in a printed text. It is a totally different problem to change a series of screens in a filmstrip.

Alternatives to Verbatim Training: Performance-Based Training

In many jobs, the most effective type of training would be to pair a trainee with an experienced worker who could then demonstrate job skills and provide immediate feedback to the trainee about her/his performance. Although "apprenticeship" training is an attractive alternative, the unique demands of survey research, as well as turnover rates of personnel, preclude its widespread use, although variants of it (for example, on-the-job training provided by supervisors after formal classroom training) are commonly used.

Although "apprenticeship" training may not be a viable alternative for training large numbers of interviewers, the basic approach can be simulated in formal classroom training by attempting to enhance the fidelity between training activities and job skills. Essentially, the use of performance-based training (see Taylor et al., 1972) requires the following changes in training design:

1. Traditional orientation and familiarization training is replaced by training that requires an interviewer to demonstrate performance of a set of high-priority skills.

2. A "lecture-demonstration-practice" paradigm is replaced by training that emphasizes individualized skill practice.

3. Lock-step, group training is replaced by individualized (self-paced) training to the maximum extent possible.

4. The trainer's role changes from one of mainly presenting information to roles of demonstrating skills, organizing skill practice exercises, and providing feedback to the trainees about their performance.

5. Little use of evaluation measures is changed to the frequent use of evaluation exercises throughout training and end-of-course proficiency reviews.

The general thrust of the preceding changes is to develop training which requires active learning from the participant. In addition, ample opportunities are provided for a trainee to assess her/his acquisition of skills and to obtain feedback about that performance.

Techniques for Implementing Performance-Based Training in Survey Research

In its efforts to implement performance-based training, the Bureau has relied on the use of simplified reference materials, self-paced learning, group-learning exercises (such as role-playing, discussion groups, problem-solving groups, etc.), and workbooks. In addition, a variety of evaluative exercises have been developed for use during training, as well as at the end of training.

For training telephone interviewers, the use of practice interviewing exercises remains the most fruitful approach for implementing performance-based training. As used to date, practice interviewing has been implemented either through the use of completely scripted practice interviews or fact

sheets.[2] To provide feedback, the Bureau has relied on observation of practice interviews, as well as a telephone monitoring system which can be used to listen to interviewers practice interviewing.

In general, it has been found that practice interviewing is most successfully conducted in pairs with one trainee serving as the interviewer and the other playing the role of respondent. Further, scripted interviews appear best for covering specific problem areas or procedures, although fact sheets can be used in their place if the interviewer trainees have sufficient experience with role playing.

Section 3: Evaluation of Interviewer Performance

The introduction of centralized telephone interviewing facilities in the headquarters of the Bureau has provided the opportunity to exact more direct control over the selection, training, and supervision of interviewers, since it has long been acknowledged that none of these functions are independent of each other. Within this context, efforts in selection, training, and supervision will be discussed next that are relevant to the evaluation of interviewer performance.

Selection: Mini-Training and Evaluation

In an effort to improve the selection process for interviewers, the Personnel Division of the Bureau has been working on the development of a selection process called "Mini-Training and Evaluation" (MTE). The rationale for this approach is that the best, and least biased, predictor of job success is performance by a job applicant on a subset of tasks that represent the job in question.

Accordingly, for the job of telephone interviewer, a representative sample of critical job skills were identified and applicants were given a mini-training session covering these tasks. Essentially, these critical skills covered question asking, probing, clarifying, and dealing with reluctant respondents. After the mini-training session the applicants conducted an interview with a person who was trained to act as a respondent, and who by using a scripted interview, was able to present a "standardized" interview for assessing the interviewer's skill. Since this "test" interview was recorded, a team of raters were then able to rate the quality of the interview on a variety of relevant dimensions (for example, articulation, question asking, following skip patterns, etc.).

Besides the content validity of this approach, this selection process also has other benefits. Because it is a relatively demanding exercise, it serves as a screening device for less motivated individuals or persons who have no conception of what telephone interviewing entails. Therefore, an

2/In a scripted interview, the trainee acting as a respondent has a script with respondent answers and required or suggested interviewer behaviors. Accordingly, specific concepts or problem areas can be emphasized. Fact sheets are lists of critical information to be supplied by a respondent. Required or suggested interviewer behaviors are not presented.

expectation is that turnover will be reduced both during and after training. Further, an unconfirmed expectation at this point is that the "test" score resulting from the MTE process will predict job performance; that is, the selection score will have predictive validity which hopefully exceeds that obtained with current selection tests.

In terms of its impact on training, MTE should supply interviewer trainees who are motivated to perform the job and who have the minimum set of skills necessary to be a successful telephone interviewer.

Evaluation of Interviewer Performance During Training

Evaluation of interviewer performance during training remains the responsibility of the trainer; however, evaluative exercises have increasingly been used both during and at the end of training. Evaluation during training has relied primarily on two techniques: observed or monitored performance during practice interviewing and performance on specially designed workbook exercises. As mentioned previously, one approach used with practice interviewing employs scripts that test the interviewer's knowledge of concepts or procedures. On the other hand, workbook exercises tend to be more testlike or cognitive in nature and frequently use multiple choice questions, form filling exercises, and so on. Whereas only a limited number of situations can be covered in practice interviews, a well designed workbook exercise can cover a large variety of problems in a short period of time.

Evaluation Measures Used at the End of Training

As the Bureau has gained experience with centralized telephone interviewing, the trend in training has been to develop measures of performance that indicate whether or not an interviewer is minimally capable to perform on the job. Assessment has generally focused on two areas: conceptual knowledge of question specifications and procedures and demonstrated skill as an interviewer. To assess these skills, the Bureau has experimented with the use of an end-of-training conceptual test and a "test" interview conducted with trained professional staff.

The conceptual tests, for the most part, have consisted of multiple choice items, although form completion exercises have also been used. The "test" interviews used at the end of training have tended to be moderately difficult scripted interviews. Volunteers from the Bureau's professional staff have served as respondents and have rated interviewers on a variety of criteria, such as pace of the interview, clarity of questioning, use of probes and clarifications, and attitude.

Interviewer Evaluation Measures Used after Training

Viewing selection, training, and supervision as critical components of the entire process required to produce a proficient telephone interviewer, the Bureau has recently experimented with the use of monitoring systems that differ from the subjective rating scales of performance commonly used. Rather than continuing to focus solely on the use of criteria such as production rates, response rates, edit-error rates, and cost per interview,

the attempt has been made to quantify the interactive process between interviewer and respondent and to rate its quality on a variety of dimensions. The general goals of this research are to identify the critical dimensions of interviewer-respondent interaction so that desired interviewer behaviors can be identified and stressed in training.

The approach being used is based on an interaction analysis model developed by Dr. Charles Cannell of the University of Michigan (Survey Research Center). This approach uses behavioral rating categories to quantify such interviewing skills as question asking, pace, voice, clarifications, probing, and the use of feedback. However, rather than use the more complex system developed by Dr. Cannell, the Bureau has developed a simplified system with fewer rating categories (see Table 4).

TABLE 4

RATING CATEGORIES FOR MONITORING INTERVIEWER PERFORMANCE

Question-Asking

- Q • Read question satisfactorily
- Q̂ • Modified question and altered meaning
- Q_+ • Read inappropriate question
- Q_- • Failed to read a required question
- Q_o • Read questions out of order

Clarifications/Definitions

- C • Clarified question or defined concept(s) correctly
- Ĉ • Clarified question or defined concept(s) incorrectly
- C_- • Did not clarify question or define concept(s) when necessary

Probing

- P • Probed correctly
- P̂ • Probed incorrectly
- P_+ • Probed unnecessarily
- P_- • Did not probe when necessary

Responsiveness

- R • Responded correctly to reluctance or extraneous comments
- R̂ • Responded incorrectly to reluctance or extraneous comments
- R_- • Did not respond to reluctance or extraneous comments

To date, the monitoring system has been used to monitor interviewer performance in a centralized telephone interviewing facility conducting Random Digit Dialing interviews. Although no definitive results are available as yet, some problems with the use of such a monitoring system in a production facility have emerged. First, it is a relatively expensive system to implement and maintain, since extensive training must be given to interviewers selected as monitors. Further, the system generates a large amount of data which must be reduced, interpreted, and the results presented to the interviewers. Finally, field supervisors have questioned the value of the results for anything other than research purposes. Consequently, the Bureau has continued to use the monitoring system but has struggled with the question of whether it will ultimately be used as a supervisory or research tool.

Questions that remain to be answered are "Who should monitor?" "How often should interviewers be monitored?" and "What happens to inter-monitor reliability over time? Specifically, even if inter-monitor reliability remains the same, does the reliability of the procedure change?" For example, it is conceivable that inter-monitor reliability could remain high over a period of time, but rater agreement with a standardized, baseline script could actually decrease.

Obviously, an important criterion for evaluating any new quality control system is the improvement in measurable performance that results from its use. To date, this type of cost-benefit analysis has not been done, so it is unlikely that the monitoring system will soon be used on a widespread basis for production interviewing. However, it is expected that the Bureau will continue to experiment with its use.

REFERENCES

Foley, J.P. Description and Results of the Air Force Research and Development Program for the Improvement of Maintenance Efficiency. Brooks Air Force Base, TX: Air Force Human Resources Laboratory, November 1973 (ERIC Document Reproduction Service No. ED 086 156).

Johnson, R.C., Thomas, D.L., and Martin, D.J. User Acceptance and Usability of the C-141 Job Guide Technical Order System. Brooks Air Force Base, TX: Air Force Human Resources Laboratory, June 1977 (NTIS No. AD-A044 001).

Joyce, R.P., Chenzoff, A.P., Mulligan, J.F., and Mallory, W.J. Fully Proceduralized Job Performance Aids: Handbook for JPA Developers. Valencia, PA: Applied Science Associates, December 1973 (NTIS No. AD-775 705).

Lineberry, C.S., and Bullock, D.H. Job Aids. The Instructional Design Library, Vol. 25. Englewood Cliffs, NJ: Educational Technology Publications, 1980.

Swezey, R.W. Performance Aids as Adjuncts to Instruction. Educational Technology, March 1977, 27-32.

Winer, B.J. Statistical Principles in Experimental Design. McGraw Hill: 1962.

Taylor, J.E. Michaels, E.R.; Brennan, M.F. The Concepts of Performance-Oriented Instruction Used in Developing the Experimental Volunteer Army Training Program. Human Resources Research Organization, Alexandria, VA: Technical Report 72-7, March 1972.

APPENDIX

Illustrations of Tables of Contents from the Job-Aid and Standard Manuals

ILLUSTRATION 1: "Table of Contents" from the job-aid manual.

CONTENTS

1. Conducting an Interview and Completing the Questionnaire 1
   - 1A. Major Steps in Your Job 1
   - 1B. Job Materials Checklist 2
   - 1C. Completing the Address Label 3
   - 1D. Completing Item 2 on Back Page of the Questionnaire 4
   - 1E. Completing the FOR CENSUS USE ONLY Box 5
     - Occupied Housing Units 5
     - Continuation Questionnaire 5
     - Vacant Housing Units 6
     - Vacant—Usual Home Elsewhere 6
   - 1F. Removing a Person From a Questionnaire 7
   - 1G. Identifying Separate Housing Units 8
   - 1H. Age Conversion Table 9

2. Reporting Progress and Costs 10
   - 2A. Recording Daily Progress on the Master Address Register Cover 10
   - 2B. Reporting to Your Crew Leader 11
   - 2C. Crew Leader Reviews of Your Work 11
     - First Review 11
     - Final Review 11
   - 2D. Payroll Forms 12
   - 2E. Intermittent Employees Pay Periods: 1980 14
   - 2F. Commonly Asked Questions About Your Job and Their Answers 15

3. A Housing Unit Is Occupied 17
   - 3A. Respondent Refuses To Be Interviewed 17
   - 3B. No One Answers the Door 18
   - 3C. Respondent Says a Questionnaire Was Mailed In 20
     - Respondent Lives in an Apartment 20
     - Respondent Lives in a Single-Family House 20
   - 3D. Visitors Are Present 22
   - 3E. There Are 8 or 9 People 22
   - 3F. There Are 10 or More People 24
   - 3G. Respondent Does Not Know Information About One of the People in the Housing Unit 25
     - The Person Usually Lives There 25
     - Checklist for Completing the Individual Census Report 25
     - None of the People Usually Live in the Housing Unit 25
   - 3H. None of the People Usually Live in the Housing Unit 28
   - 3I. Respondent Did Not Live in the Housing Unit on Census Day 32
   - 3J. Respondent Does Not Speak English 33
   - 3K. The Address Is a Special Place 34
   - 3L. The Housing Unit Received Two Questionnaires 36
   - 3M. Apartment Numbers (or Letters) Do Not Match Those Entered in Column 4 of the Address Listing Page 36
   - 3N. You Do Not Know If a Person Should Be Listed in Question 1 38
     - Table of Residence Rules 38

ILLUSTRATION 2: "Table of Contents" from the standard census manual.

apter		Page
5	Preparing for Followup Enumeration	43
	5.A Organize Materials	43
	5.B Determine Which Housing Units Require Nonresponse Followup	44
	5.C Plan Itinerary	44
	5.D Final Preparation	46
6	How to Use the Questionnaires	47
	6.A Handling Questionnaires	47
	6.B Types of Entries Required	47
7	How to Enumerate Nonresponse Cases	51
	7.A Determining the Type of Questionnaire for Each Housing Unit	51
	7.B Determining the Status of the Housing Unit	52
	7.C Completing Questionnaires for Occupied Housing Units	54
	7.D Completing a Continuation Questionnaire	67
	7.E Completing Questionnaires for Vacant Housing Units	69
	7.F Completing Questionnaires for "Vacant-UHE" Housing Units	70
	7.G Making Entries on the Address Listing Page for Nonresponse Addresses	75
8	Enumerating With Form D-20, Individual Census Report (ICR)	77
	8.A When to Use the ICR	77
	8.B Visitors or Temporary Residents Staying at an Occupied Housing Unit	77
	8.C Lodgers and Other Persons Listed in Question 1	80
9	Enumeration Problems	83
	9.A Gaining Cooperation	83
	9.B Refusal Cases	83
	9.C Households Where No One Is Home	84
	9.D Households You Are Unable to Contact After Four Visits	87
	9.E Last Resort Information	87
	9.F Persons Who Say They Were Not Counted	89
	9.G Cancelling a Listing	90
	9.H Housing Units You Cannot Locate	91
	9.I Listing Problems	92
	9.J People Who Say They Mailed a Questionnaire	95
	9.K Special Places	95
	9.L Late Mail Returns in the District Office	97
	9.M Language Problems	98
	9.N Cluster-Listed Housing Units	100
	9.O Apartment Mixups	103